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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
OH, TAYLOR V	
ART UNIT	**PAPER NUMBER**
1625	

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/996,480	GRUZINS ET AL.	
	Examiner	Art Unit	
	Taylor Victor Oh	1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25,27-29 and 31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25,27-29 and 31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *4/17/02* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/01/05 has been entered.

The Status of Claims

Claims 1-25 , 27-29, and 31 are pending.

Claims 1-25 , 27-29, and 31 have been rejected.

DETAILED ACTION

Claims 1-25 , 27-29, and 31 are under consideration.

Priority

1. It is noted that the application is a CIP of 09/723,263 (U.S. 6,716,913) filed on 11/27/02.

Drawings

2. The drawings filed on 4/17/02 are accepted by the examiner.

Claim Objections

Claim 13 is objected to because of the following informalities:

In claim 13, the phrase " for use " is recited. The claim is directed to the method of preparing a carboxyl-containing monomer. That phrase has revealed the method for the use in the preparation of a polyurethane polymer without describing any steps for that method. Therefore, the examiner recommends to remove that phrase in the claim. An appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-3, 5-19, 21-25, 27-29, and 31 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for hydrochloric acid ,sulfuric acid ,nitric acid ,formic acid, propionic acid , p-toluenesulfonic acid, oxalic acid , does not reasonably provide enablement for all the known organic or inorganic acid catalysts in the chemistry. The specification does not enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to include all the catalysts unrelated to the invention commensurate in scope with these claims. Furthermore, the instant specification fails to provide information that would allow the skilled artisan to practice the instant invention without **undue experimentation.** Attention is directed to *In re Wands*, 8 USPQ2d 1400 (CAFC 1988) at 1404 where the court set forth the eight factors to consider when assessing if a disclosure would have required undue experimentation, citing *Ex Parte Forman*, 230 USPQ 546 (BdApls 1986) at 547 the court recited eight factors:

1) the quantity of experimentation necessary,

2) the amount of direction or guidance provided,

3) the presence or absence of working examples,

4) the nature of the invention,

5) the state of the prior art,

6) the relative skill of those in the art,

7) the predictability of the art, and

8) the breath of the claims.

In the instant case, the claim encompasses various organic or inorganic catalysts. Applicants' specification provides some of the catalyst compounds such as hydrochloric acid ,sulfuric acid ,nitric acid , propionic acid , p-toluenesulfonic acid, formic acid and oxalic acid. However, it is questionable that the other types of organic or inorganic catalysts would work the same ways as in the above in the claimed process.

Catalyst compositions represent an unpredictable aspect in the art of organic chemistry . See Exparte Sizto, 9 USPQ2d 2081 (Bd. Of App. And Inter. March 1988). This is because all the catalysts would not behave the same ways in any kind of reactions.

Thus, the specification herein have failed to provide sufficient working examples to support the use of all kinds of inorganic and organic catalysts. Therefore, an appropriate correction is required.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 provides for the use of a method of preparing a carboxyl-containing monomer, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 13 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 14 , the phrases " said low molecular weight polyol compound includes" is recited. The expression is vague and indefinite because the term "includes" would mean that there are other additional components besides the said low molecular weight polyol compound and at the same time the claim does not describe what has been excluded in the claim . The examiner may wonder what else is in the low molecular weight polyol compound. Therefore, an appropriate correction is required.

Claim Rejections - 35 USC § 103

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-25 and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Housel et al (U.S. 6,103,822) in view of Koistinen et al (WO 98/50338).

Housel et al teaches a polymeric acid functional polyol which is a reaction product of one polymer, such as polyester polyols, polyether polyols , polyetherester polyols and a nonaromatic polyanhydride in the presence of tin metal oxide catalysts (see col. 13 ,lines 19-21) in an amount of from 0 to 30,000 ppm (see col. 13 ,lines 22-24) for the purpose of controlling the reaction. The polymeric acid functional polyol has an acid value of from 10 to 150, a hydroxy

value of form 20 to 500 and a hydroxy functionality of at least 2, and preferably from 2 to 4 (see col. 3 ,lines 46-54).

Furthermore, Aliphatic diacids used in the esterification reaction are oxalic acid, malonic acid, succinic acid ,glutaric acid and their anhydrides ; in addition, the polyols useful in the esterification reaction can be monomeric or polymeric (see col. 9, lines 60-67). Exemplary monomeric polyols include ethylene glycol, trimethylol propane and etc. (see col. 10, lines 5-8). Besides, for the manufacturing polyester polyols, the reactant carboxylic acids may render a residual acid value of less than 10 mg KOH/g with polyester polyols having acid values less than 1.5 (see col. 1, lines 35-40).

Moreover, water borne polyurethanes are formed as a urethane reaction product of a polymeric acid functional polyol and a polyisocyanate (see col. 11, lines 5-7), which may selected from any polyisocyanates useful for preparing polyurethanes (see col. 11, lines 31-32). Valuable polyisocyanates may include 2,2'-, 2,4'- and 4,4'- diphenylmethane diisocyanates. (see col. 11, lines 54-56).

In addition, water borne polyurethanes may contain primary or secondary polyamines as chain extenders, property modifiers, or crosslinkers and their examples are 1,2-ethylenediamine, hexamethylene diamine, isophorone diamine, 2,2-cyclohexylamine, and etc. (see col. 12 ,lines 50-59).

Also, in one of the examples (#9), an acid functional polyol product has a hydroxy functionality of at least 2 , and a viscosity of 12100 cps at 250^0 C. (see col. 19 ,lines 5-15).

The instant invention, however, differs from the prior art in that the claimed reaction product is formed in the presence of an organic acid or inorganic acid; the polyol composition has an oligomer content of less than 30 mg KOH/g.

Koistinen et al discloses the process of preparing complex polyol esters by reacting a polyol with mono- and polybasic acids and/ or anhydrides (see page 3 ,lines 9-10) in the presence of a catalyst , such as sulfuric acid, hydrochloric acid or metal oxides, such as titanantes or tin oxides (see page 3 , lines 17-18) in the amount of from 0.05 to 0.5 % of the reacting components (see page 3 ,lines 16-18); the reaction mixture is treated with a base to neutralize the acid components, and the complex esters are retrieved (see page 1 ,lines 6-10). In the process, all the reactants are heated for 3-10 hours at $180\text{-}240^0$ C until the acid number has decreased below 10 mg KOH/g (see page 3 ,lines 12-15).

With respect to the oligomer content of less than 30 mg KOH/g,

the reference does indirectly indicate the oligomer content in view of the passages of the prior art (see col. 4 ,lines 9-16), which describes that the reaction is terminated when the acid functional polyol has an acid value of from 10 to 150 during the process for making the polymeric acid functional polyol based on the esterified products. Therefore, it does teach that the prior art's polyol composition has an oligomer content of less than 30 mg KOH/g.

Housel et al does describe the polymeric acid functional polyol which is the reaction product of polyols and the acid anhydride in the presence of tin metal oxide catalysts (see col. 13 ,lines 19-21) in an amount of from 0 to 30,000 ppm (see col. 13 ,lines 22-24) for the purpose of controlling the reaction.

Similarly, Koistinen et al discloses the process of preparing complex polyol esters by reacting a polyol with mono- and polybasic acids or in the presence of a catalyst , such as sulfuric acid, hydrochloric acid or metal oxides, such as titanantes or tin oxides; furthermore, the Koistinen et al has offered guidance that there is an equivalence of teaching regarding the use of the catalyst between the hydrochloric acid and tin oxides.

Both prior art processes have commonly dealt with the production of carboxy-containing polyol composition with similar reaction conditions (i.e. reactants). Therefore, it would have been obvious to the skillful artisan in the art to be motivated to employ Koistinen's et al hydrochloric acid into the Housel et al process as an alternative to the Housel's et al tin oxide because the skilled

artisan in the art would expect such a modification to be successful and effective as guidance shown in Koistinen et al .

Applicants' Argument

1. Housel does raise the potential problems of forming unwanted side reactions as a result of using particular catalysts at a high temperature or those problems associated with the long conversion to the acid polyol as a result of using particular catalysts at a low temperature; furthermore, there are no solution of the problems in Housel.

2. Housel does not suggest or disclose any catalyst other than an organometallic catalyst ,such as organotin;

3. There is no motivation to combine the Housel with Koistinen et al since Koistinen et al has disclosed only the tin oxide catalyst employed in examples.of 1-3 and 5-31 and Housel discloses the potential catalyst problems without any solutions.

First, with respect to the first argument, the Examiner has noted applicants' argument. However, the claims are not directed to the potential problems of forming unwanted side reactions as a result of using particular catalysts at a high temperature or to those problems with the long conversion to the acid polyol as a result of using

particular catalysts at a low temperature , but the claims are directed to a low viscosity carboxyl containing polyol composition. Therefore, applicants' argument are irrelevant to the issue of the claims.

Second, with respect to the second argument, the Examiner has noted applicants' argument. However, the Housel prior art does teach not only organotin as a catalyst , but also the use of "catalysts" in general (see col. 8 ,line 1) in the process. The term "catalysts" imply that any catalysts would work for the process. Therefore, applicants' argument are irrelevant to the issue of the claims.

Third, with respect to the third argument, the Examiner has noted applicants' argument. However, Housel et al does describe the polymeric acid functional polyol which is the reaction product of polyols and the acid anhydride in the presence of tin metal oxide catalysts (see col. 13 ,lines 19-21) in an amount of from 0 to 30,000 ppm (see col. 13 ,lines 22-24) for the purpose of controlling the reaction.

Similarly, Koistinen et al discloses the process of preparing complex polyol esters by reacting a polyol with mono- and polybasic acids or in the presence of a catalyst , such as sulfuric acid, hydrochloric acid or metal oxides, such as titanantes or tin oxides; furthermore, not only the tin oxide catalyst employed in examples of 1-3 and 5-31, but also example 4 shows any "catalyst" described in the passages (see page 3 , lines 12-18): for example, sulfuric acid, hydrochloric acid or metal oxides, such as titanantes or tin oxides; any one of them would work for the process.

Moreover, the Koistinen et al does offer guidance that there is an equivalence of teaching regarding the use of the catalyst between the hydrochloric acid and tin oxides. Therefore, there is a motivation to combine the prior art. Furthermore, both prior art processes have commonly dealt with the production of carboxy-containing polyol composition with similar reaction conditions (i.e. reactants). Therefore, it would have been obvious to the skillful artisan in the art to be motivated to employ Koistinen's et al hydrochloric acid into the Housel et al process as an alternative to the Housel's et al tin oxide because the skilled artisan in the art would expect such a modification to be successful and effective as guidance shown in Koistinen et al . Therefore, applicants' argument are irrelevant to the issue of the claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang can be reached on 571-272-0562. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*** Ingrid V. Ott
1/19/06